

Claims

What is claimed is:

1. A driver circuit for an optical source, the driver circuit comprising:  
at least an input stage and an output stage, the output stage being operatively coupled  
5 to the input stage; and

a current generator circuit adapted to establish a modulation current for application  
to one of a first output and a second output of the output stage in accordance with a differential input  
data signal applied to the input stage;

the input stage being configured to include first and second differential pairs;

10 the first differential pair having the differential input data signal applied thereto, and  
being implemented using MOS devices;

the second differential pair receiving as its inputs corresponding outputs of the first  
differential pair, and being implemented using bipolar devices;

15 the first and second differential pairs being configured such that application of the  
differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair  
will not exceed a junction reverse bias constraint of the second differential pair.

2. The driver circuit of claim 1 wherein the optical source comprises a laser diode.

- 20 3. The driver circuit of claim 1 wherein the output stage comprises a differential pair.

25 4. The driver circuit of claim 1 wherein the input data signal comprises a single-ended input  
data signal configured for conversion internally to the driver circuit to a differential data signal  
adapted to control application of the modulation current to the first and second outputs of the output  
stage.

5. The driver circuit of claim 1 wherein the first differential pair is configured to provide  
substantially unity gain.

6. The driver circuit of claim 1 wherein the second differential pair is configured to provide  
a gain greater than unity.

7. The driver circuit of claim 1 wherein the bipolar devices of the second differential pair  
5 comprise SiGe bipolar transistors having the reverse bias constraint.

8. An integrated circuit comprising:  
at least one driver circuit for an optical source, the driver circuit comprising:  
10 at least an input stage and an output stage, the output stage being operatively coupled  
to the input stage; and  
a current generator circuit adapted to establish a modulation current for application  
to one of a first output and a second output of the output stage in accordance with a differential input  
data signal applied to the input stage;  
the input stage being configured to include first and second differential pairs;  
15 the first differential pair having the differential input data signal applied thereto, and  
being implemented using MOS devices;  
the second differential pair receiving as its inputs corresponding outputs of the first  
differential pair, and being implemented using bipolar devices;  
the first and second differential pairs being configured such that application of the  
20 differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair  
will not exceed a junction reverse bias constraint of the second differential pair.

9. The integrated circuit of claim 8 wherein the optical source comprises a laser diode.

25 10. The integrated circuit of claim 8 wherein the output stage comprises a differential pair.

11. The integrated circuit of claim 8 wherein the input data signal comprises a single-ended  
input data signal configured for conversion internally to the driver circuit to a differential data signal

adapted to control application of the modulation current to the first and second outputs of the output stage.

12. The integrated circuit of claim 8 wherein the first differential pair is configured to  
5 provide substantially unity gain.

13. The integrated circuit of claim 8 wherein the second differential pair is configured to provide a gain greater than unity.

10 14. The integrated circuit of claim 8 wherein the bipolar devices of the second differential pair comprise SiGe bipolar transistors having the reverse bias constraint.

15. An apparatus comprising:  
an optical source; and  
a driver circuit coupled to the optical source, the driver circuit comprising:  
at least an input stage and an output stage, the output stage being operatively coupled to the input stage; and  
20 a current generator circuit adapted to establish a modulation current for application to one of a first output and a second output of the output stage in accordance with a differential input data signal applied to the input stage;  
the input stage being configured to include first and second differential pairs;  
the first differential pair having the differential input data signal applied thereto, and being implemented using MOS devices;  
the second differential pair receiving as its inputs corresponding outputs of the first differential pair, and being implemented using bipolar devices;  
25 the first and second differential pairs being configured such that application of the differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair will not exceed a junction reverse bias constraint of the second differential pair.

16. A circuit comprising:

at least an input stage and an output stage, the output stage being operatively coupled to the input stage;

the input stage being configured to include first and second differential pairs;

5 the first differential pair having a differential input data signal applied thereto, and being implemented using MOS devices;

the second differential pair receiving as its inputs corresponding outputs of the first differential pair, and being implemented using bipolar devices;

10 the first and second differential pairs being configured such that application of the differential input data signal at a substantially rail-to-rail voltage swing to the first differential pair will not exceed a junction reverse bias constraint of the second differential pair.

17. The circuit of claim 16 wherein the circuit comprises a driver circuit for an optical source.

18. The circuit of claim 16 wherein the circuit comprises a limiting amplifier.